Research and Teaching at the Centre for Online Health

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I. INTRODUCTION

The Centre for Online Health (COH) is a university research centre, closely linked with (and located in) a tertiary hospital. Research at the COH is directed at the development of new models of healthcare delivery, models that are applicable in Australia and other countries. That is, models of healthcare delivery which are:

- feasible
- safe
- clinically useful
- cost-effective
- sustainable.

To achieve these goals means conducting clinical research trials. Thus the focus of the work at the COH is on clinical trials, not on technology development.

The COH is responsible for a broad range of collaborative projects which explore and evaluate innovative methods of providing clinical services in metropolitan and regional environments, including telemedicine, health information systems and health education. Current research work can be divided into real-time and non-real-time applications.

II. NON-REAL-TIME APPLICATIONS

Email is a much underused medium for telemedicine.

Global e-Referral Network

Email has been used for some years as a low-cost telemedicine medium to provide support for developing countries, not least by the Swinfen Charitable Trust (SCT), a charity based in the UK [1]. The SCT uses digital cameras and email to provide specialist advice to doctors in developing countries. The first telemedicine link was set up at a hospital in Bangladesh in July 1999. By the end of a year there were three links to hospitals in Bangladesh, Nepal and the Solomon Islands; there are now 33 hospitals in 16 countries referring cases to the network. There is a large panel of consultants – more than 100 – all of whom give their advice free of charge.

Most telemedicine operations based on email have been relatively small scale and fairly labour-intensive to administer. We have developed methods of automatic message-handling to solve many of the problems of manual email telemedicine systems, and since early 2002, a computerised message-routing system has been used by the SCT which automates many of the message-handling tasks [2]. This represents a potentially scalable way of doing low-cost telemedicine in the developing world. The technology provides a generic solution to the problems of operating non-realtime (store-and-forward) telemedicine networks.

National Counselling Service

Similar automatic message-handling technology has now been applied to manage the email traffic resulting from a national children's counselling service. This service receives 40-50 new email messages per day from clients across Australia. A team of professional counsellors sends replies by email. The new email management system permits the supervisors an overall view of the email traffic and allows counsellors to compose their replies online. Subsequent messages from a client are routed automatically to the inbox of 'their' counsellor. No special software is required by the users as the whole system is operated via a standard web browser. During pilot trials of the system in January 2004, the mean length of time between receipt of new client messages and response by a counsellor fell substantially. The system was brought into routine operation in May 2004, since when there have been significant savings in staff time (approx 0.5 FTE) and other efficiency gains [3].

III. REAL-TIME APPLICATIONS

Teleconsulting work may use high-bandwidth or low-bandwidth video links.

Telepaediatrics (high bandwidth)

In November 2000, the Centre for Online Health commenced a research project to establish and evaluate a novel telepaediatric service in Queensland. The service depends on a centralized coordination unit, and is currently available to several regional and remote hospitals in Queensland, including those at Mackay, Hervey Bay, Rockhampton, Emerald and Gladstone.

The telepaediatric service provides convenient access to specialist paediatric services, the majority of which are located at the Royal Children's Hospital in Brisbane. A response to the referring clinician is guaranteed within 24 hours. A range of communication technologies are used, including email, telephone and videoconferencing. About 80% of all referrals result in a consultation via videoconference [4].

Over the last four years, 1800 consultations have been coordinated through the telepaediatric service. The telepaediatric service is multidisciplinary, providing expert collaboration in a wide range of fields including diabetes, endocrinology, burns, cardiology, dermatology, oncology, orthopaedics, gastroenterology, neurology and paediatric surgery [5-7].

Comparisons between patient admission/outpatient data from selected regional sites pre- and post-telepaediatrics have shown a marked reduction in the number of children travelling to Brisbane for an outpatient appointment and a substantial increase in the number of children accessing specialist services in their local hospital (via videoconference) [8].

In a study involving 400 families, we compared the costs of attending an outpatient appointment in person (at the RCH) to the costs of attending an outpatient appointment via videoconference (at a regional hospital close to home). Outpatient appointments conducted via videoconference were much less costly for families compared to the conventional method of attending outpatient appointments at the specialist hospital [9].

Palliative Care (low bandwidth)

Paediatric palliative care patients in rural and remote areas of Queensland do not receive the same specialist care as that provided in metropolitan areas. Telemedicine may offer a solution to this problem. We have designed, built and tested a portable, Internet-based videophone that uses the home telephone line for IP videoconferencing [10].

Palliative patients of the Royal Children's Hospital paediatric oncology service will be randomised into two groups, a control group who will receive services via traditional mechanisms, and an intervention group, who will be offered a telemedicine home service. Clinical, psychosocial and educational services will be provided directly to the home by the hospital palliative care team using the videophone.

IV. TEACHING

The best teaching is generally delivered in association with an active research programme. The increasing use of IT in healthcare requires professionals with the appropriate training and education. The COH offers a range of e-healthcare courses, mainly delivered online. These begin at undergraduate level and lead to the Masters degree in e-healthcare (MeH). For further information, see http://www.uq.edu.au/coh.

V. CONCLUSION

The COH is one of very few research and teaching centres in the world which focus on the evaluation of telemedicine for the delivery of health services. In an academic hospital, the boundary between Research and Service is often blurred. For academic telemedicine work, in particular, this can be a grey area – is the activity in question research, or is it a service? To conduct health services research (which is ultimately what is required in telemedicine) it may be necessary to establish a service. This can create funding difficulties, since research grant-giving bodies may not wish to fund a service, and health care providers will often refuse to fund research. As has been observed before, conducting rigorous telemedicine research is not easy. On the other hand, the benefits should justify the effort involved.

REFERENCES

[1] R. Swinfen, P. Swinfen, "Low-cost telemedicine in the developing world", *J Telemed Telecare*, 8 Suppl 3, 63-65, 2002

[2] P. Swinfen, R. Swinfen, K. Youngberry, R. Wootton, "A review of the first year's experience with an automatic message-routing system for low-cost telemedicine", *J Telemed Telecare*, 9 Suppl 2, 63-5, 2003

[3] L. Caffery, K. Crew-Wegner, W. Reid, R. Wootton, "Automatic message-handling for a national counselling service", *J Telemed Telecare*, in press

[4] A.C. Smith, A. Isles, R. McCrossin, J. Van der Westhuyzen, M. Williams, H. Woollett, R. Wootton, "The point-of-referral barrier–a factor in the success of telehealth", *J Telemed Telecare*, 7 Suppl 2, 75-8, 2001

[5] R. Justo, A.C. Smith, M. Williams, J. Van der Westhuyzen, J. Murray, G. Sciuto, R. Wootton, "Paediatric telecardiology services in Queensland: a review of three years experience", *J Telemed Telecare* 2004, in press

[6] A.C. Smith, K. Youngberry, J. Mill, R. Kimble, R. Wootton, "A review of three years experience using email and videoconferencing for the delivery of post-acute burns care to children in Queensland", *Burns*, 30: 248-52, 2004

[7] A.C. Smith, J. Batch, E. Lang, R. Wootton. "The use of online health techniques for the delivery of specialist paediatric diabetes services in Queensland", *J Telemed Telecare*, 9 Suppl. 2, 54-57, 2003

[8] A.C. Smith, M. Williams, J. Van der Westhuyzen, R. McCrossin, A. Isles, R. Wootton, "A comparison of telepaediatric activity at two regional hospitals in Queensland", *J Telemed Telecare*, 8 Suppl 3, 58-62, 2002

[9] A.C. Smith, K. Youngberry, F. Christie, A. Isles, R. McCrossin, M. Williams, J. Van der Westhuyzen, R. Wootton, "The family costs of attending hospital outpatient appointments via videoconference and in person", *J Telemed Telecare* 9 Suppl 2, 58-61, 2003

[10] M. Bensink, N. Armfield, T. Russell, H. Irving, R. Wootton, "Paediatric palliative home care with Internet-based videophones: lessons learnt", *J Telemed Telecare*, in press